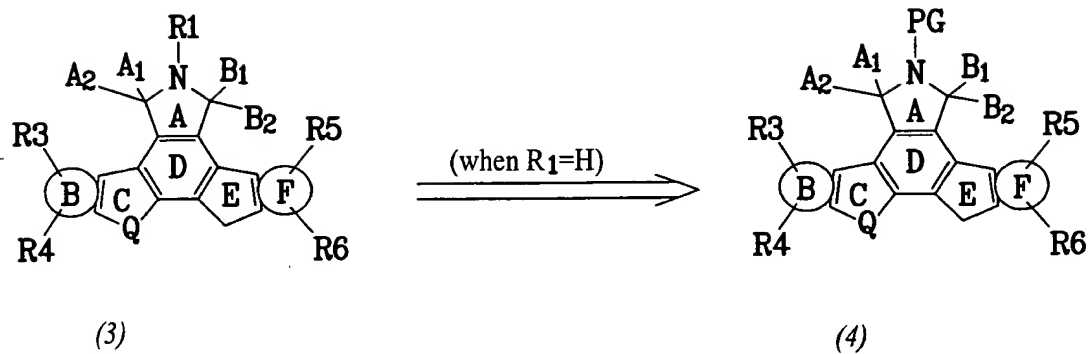




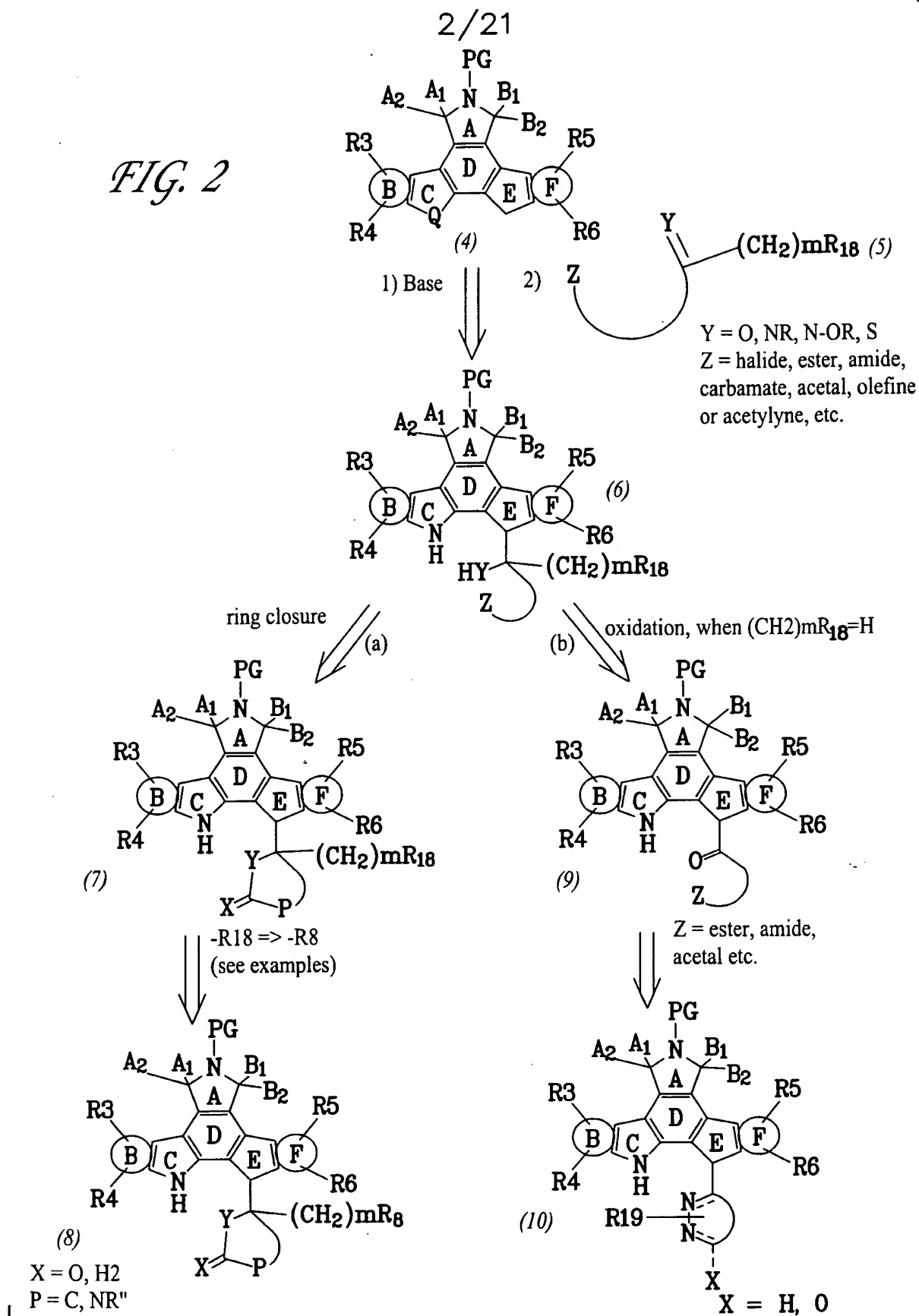
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FIG. 1



PG = Protecting Group  
or  
Polymeric Support

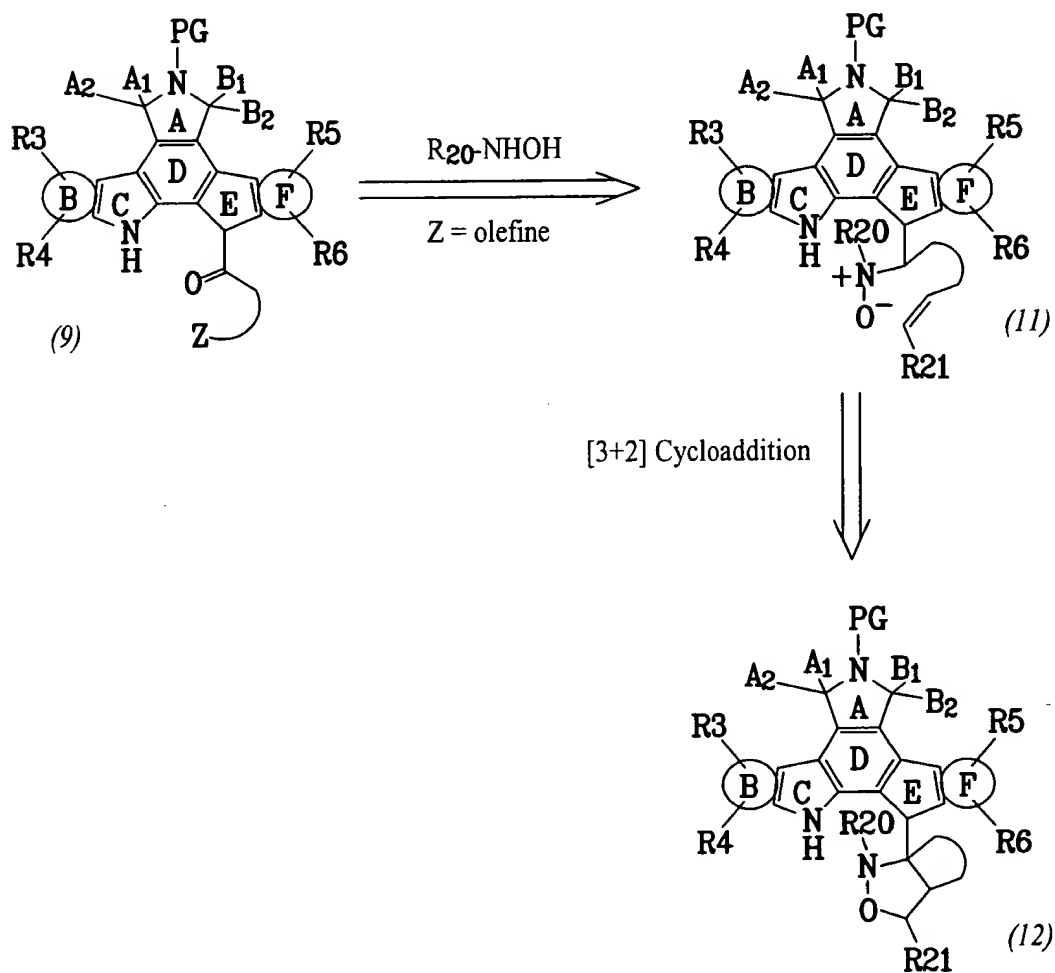
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FIG. 3

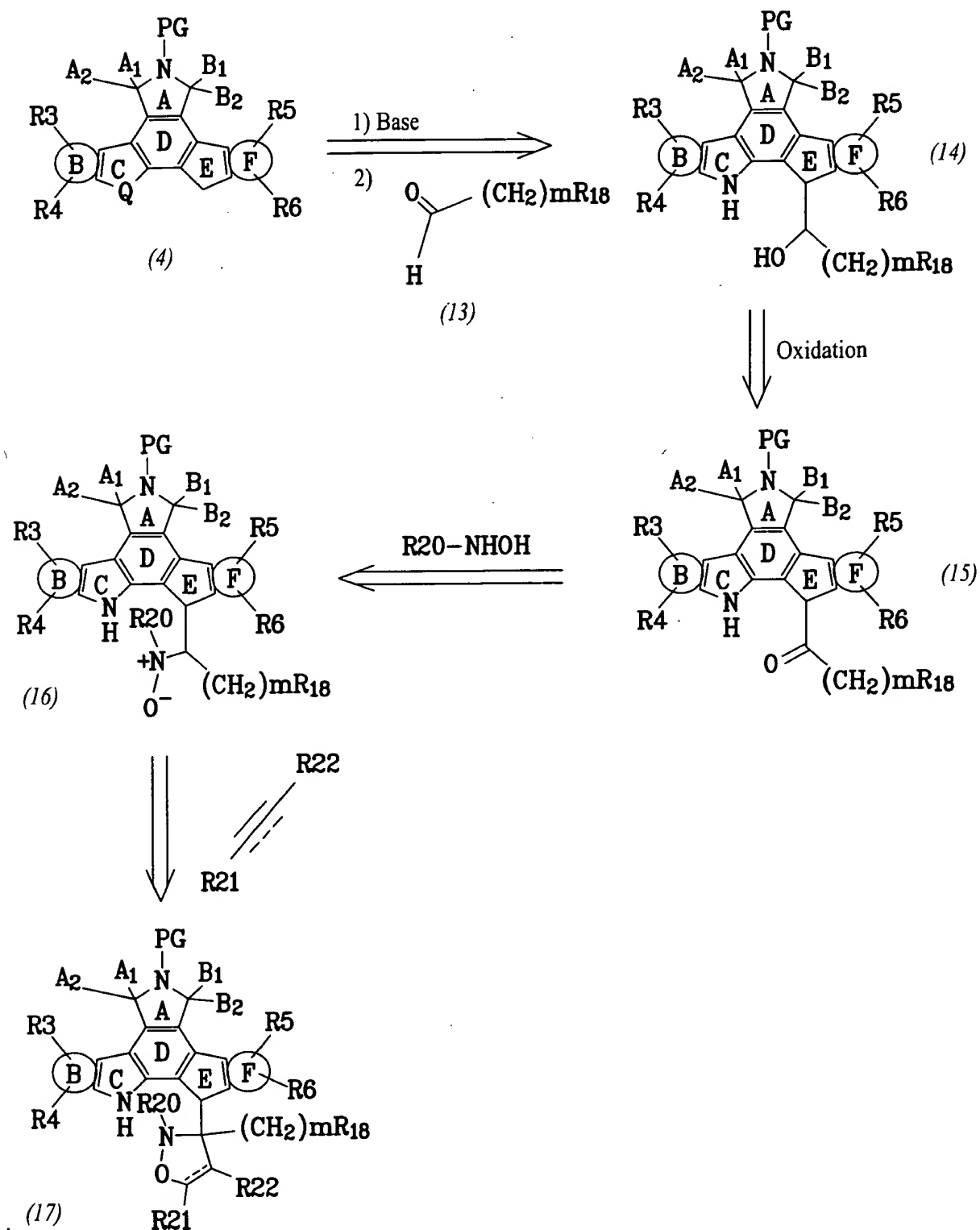
Preparation of Cyclic Substituents via Intra-Molecular Dipolar Cycloaddition



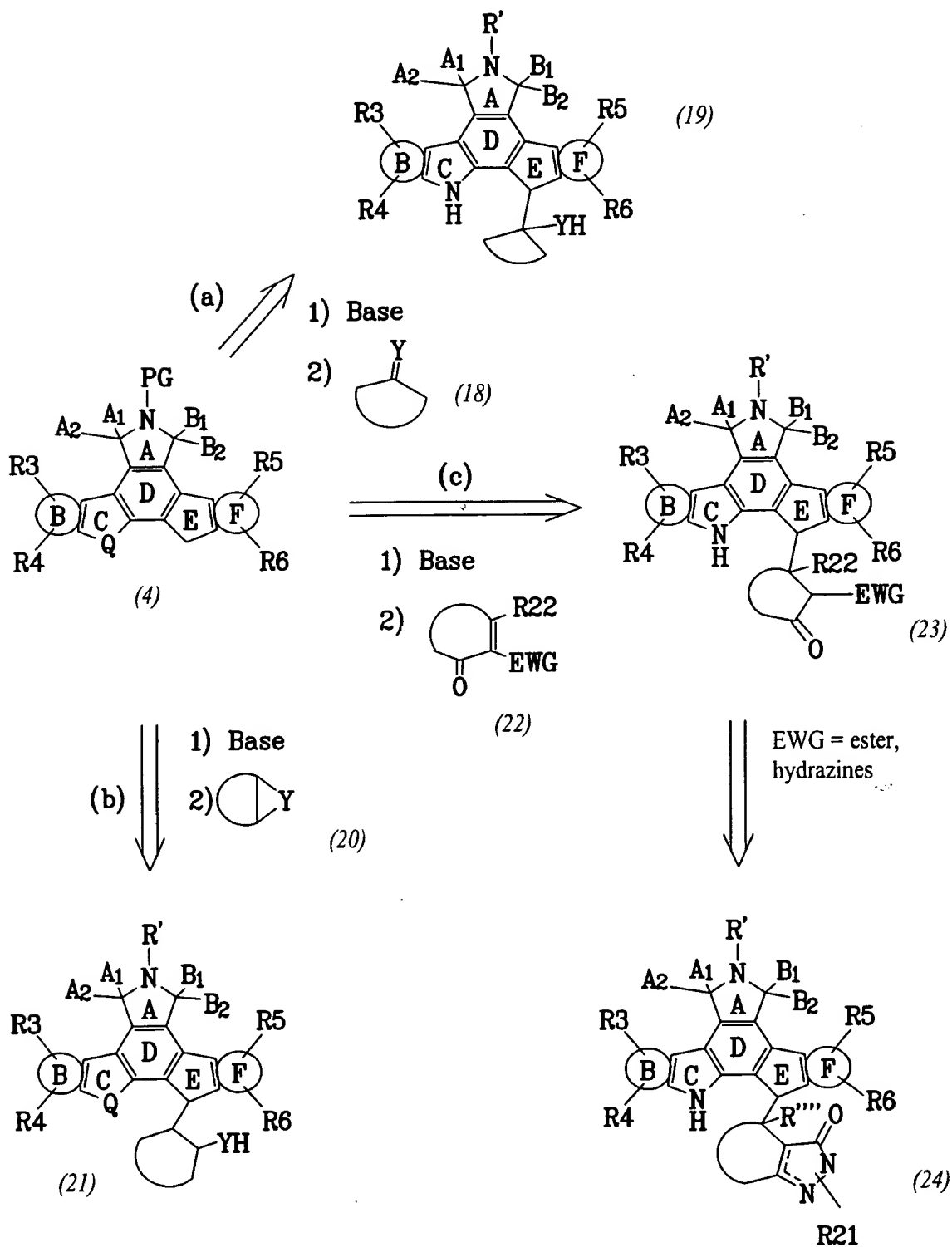


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*FIG. 4*

Preparation of Cyclic Substituents via Intra-Molecular Dipolar Cycloaddition



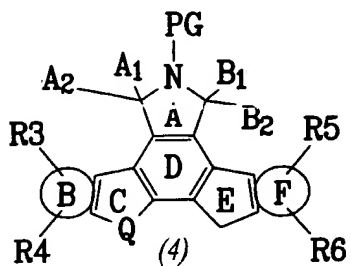
5/21  
FIG. 5



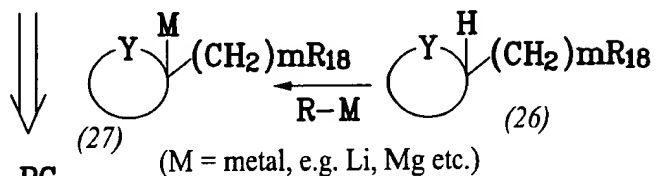
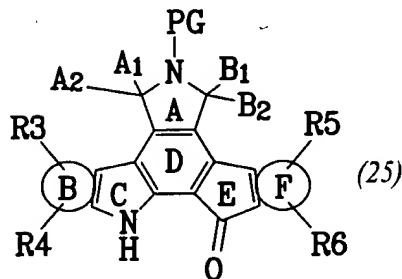


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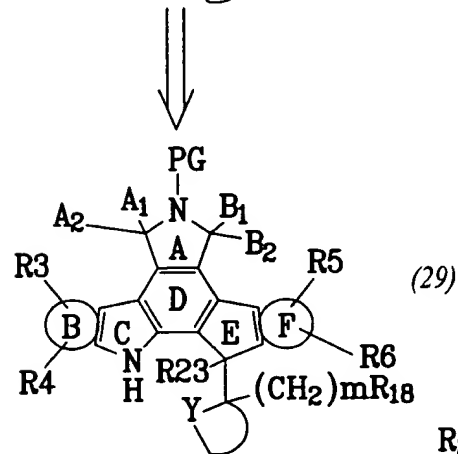
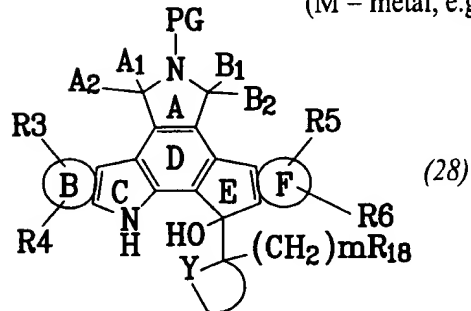
FIG. 6



Oxidation



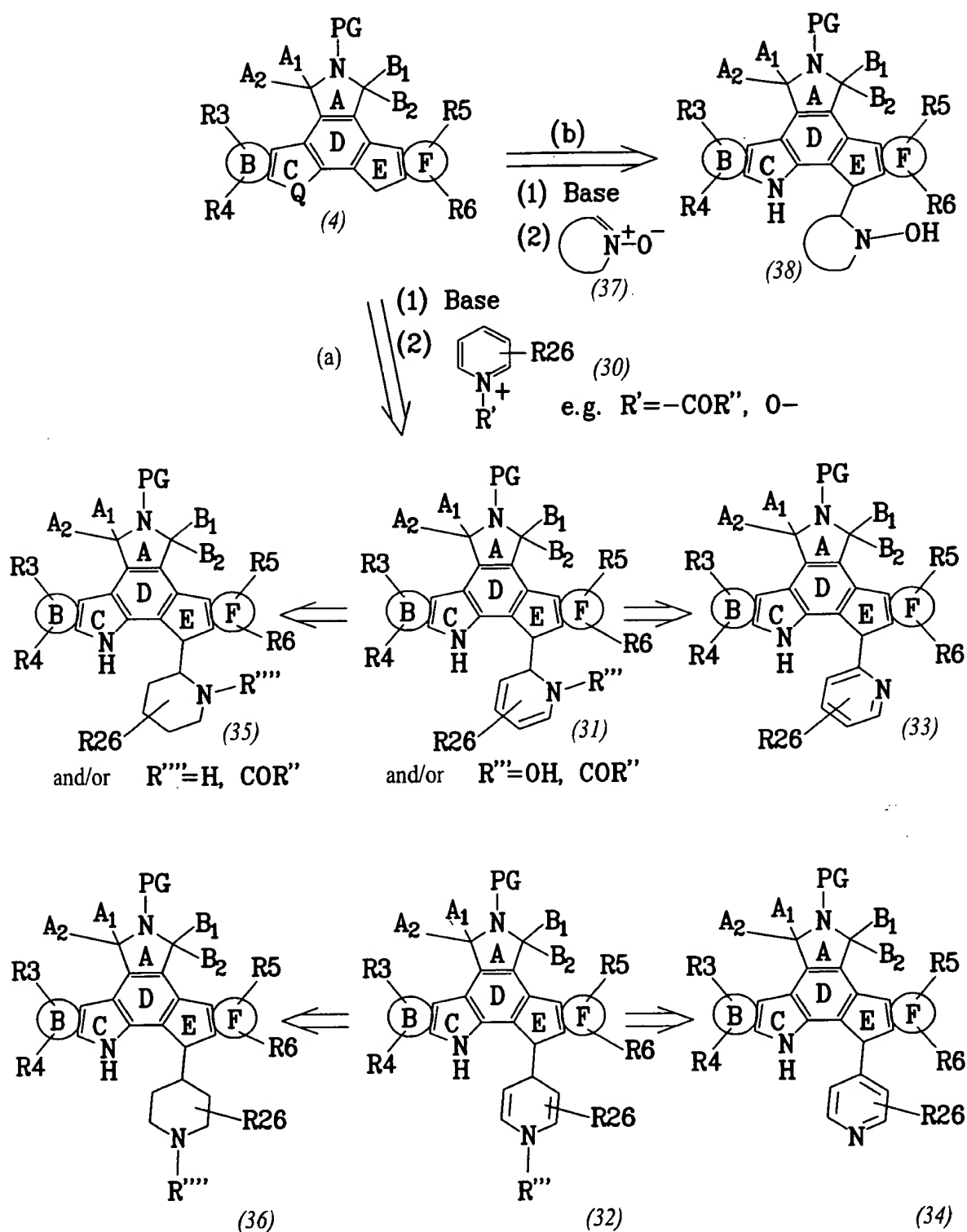
(M = metal, e.g. Li, Mg etc.)



R<sub>23</sub> = F, SR, H etc.

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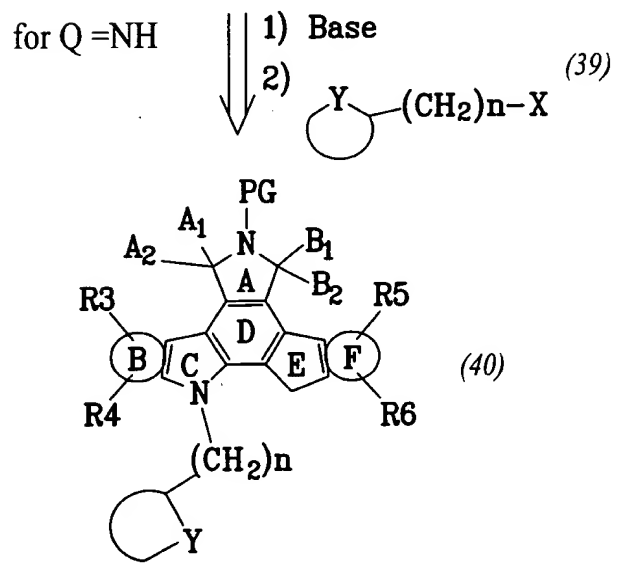
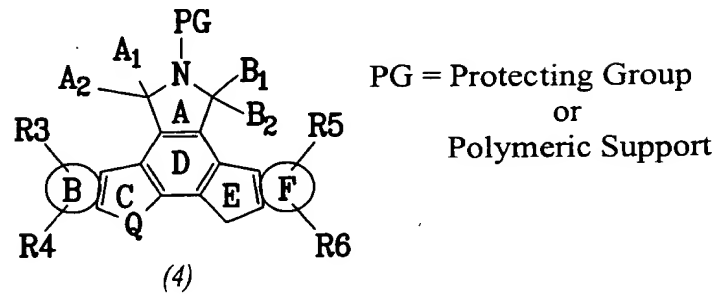
FIG. 7





7

FIG. 8

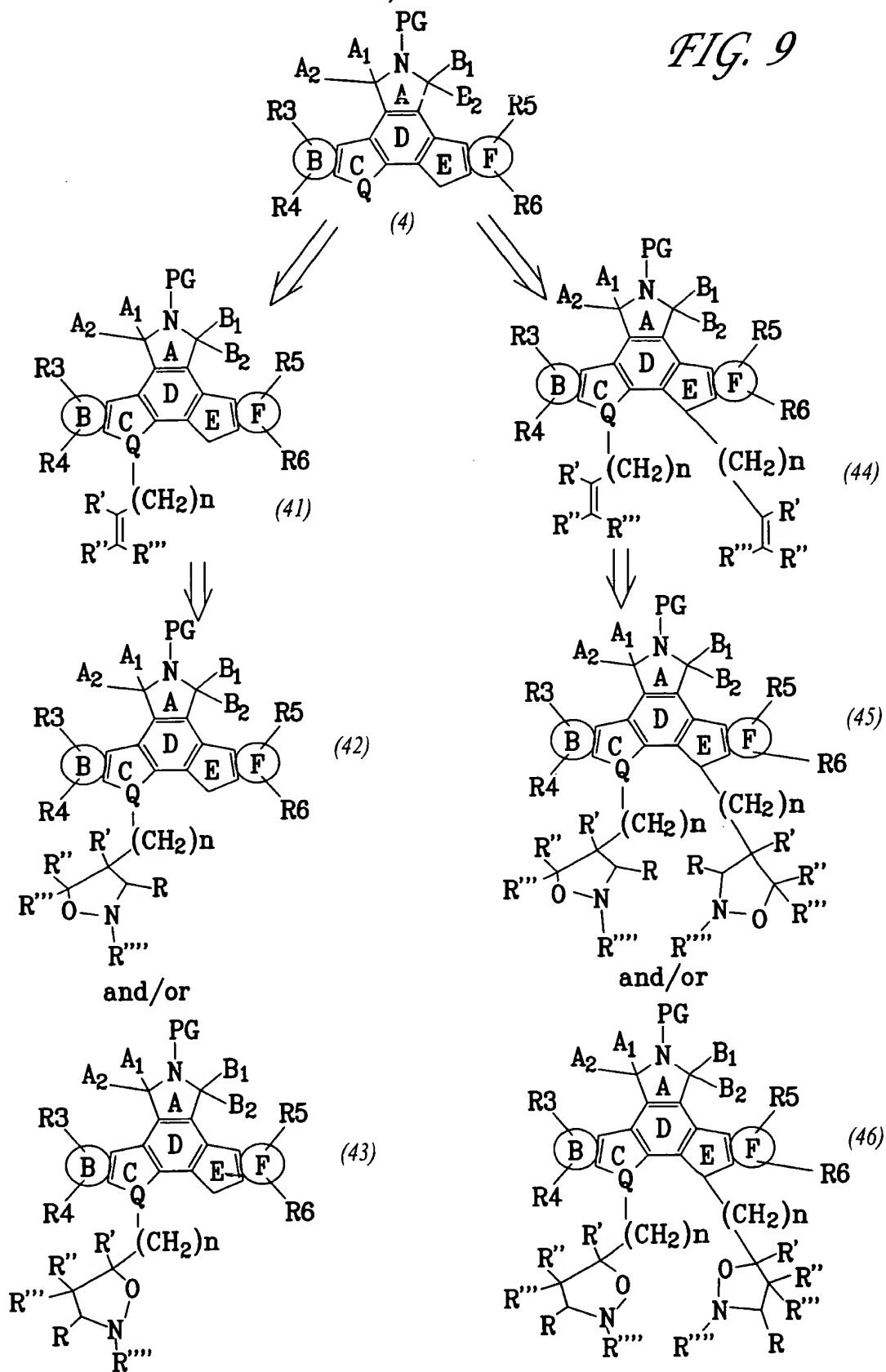


L



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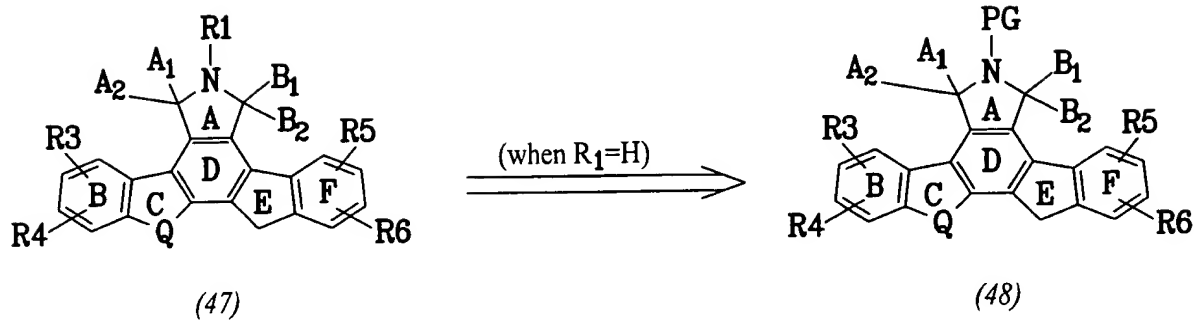
FIG. 9





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FIG. 10



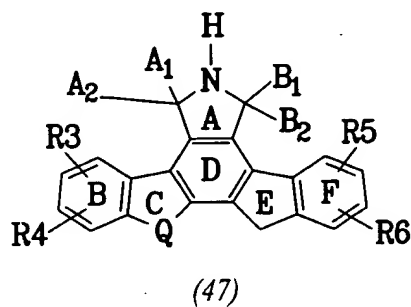
PG = Protecting Group  
or  
Polymeric Support



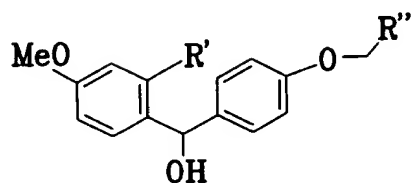
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# FIG. 11

Preparation of Soluble and Resin-bound N-lactam  
 protected Fused Pyrrolocarbazoles (FP)



TsOH, Toluene, NMP, 140°C



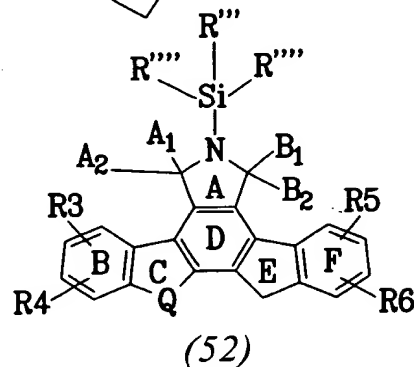
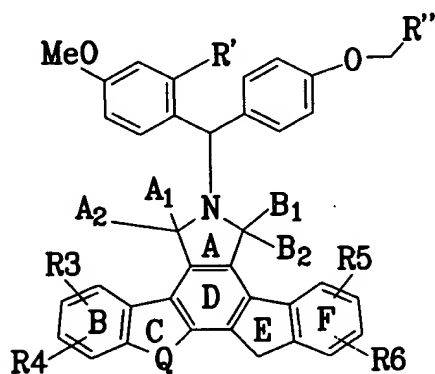
(51a)  $R' = H, R'' = H$

(51b)  $R' = OMe, R'' = \text{Polymer}$

$(R''')_2R''''Si-X$

Base

THF, DMF or NMP



$R''' = Me, R'''' = tBu$  (TBS)

$R''' = Ph, R'''' = tBu$  (TBS)

(49)  $R' = H, R'' = H \gg$  soluble protected FP  
 (N-protecting group abbreviated as DMB)

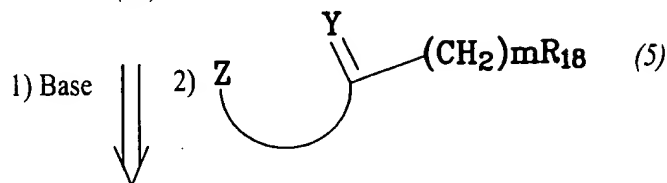
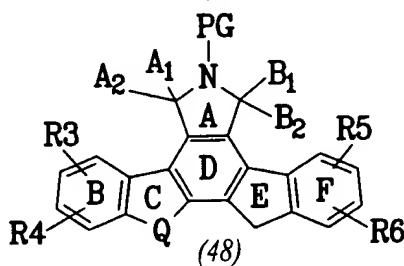
(50)  $R' = OMe, R'' = \text{Polymer} \gg$  solid-bound PG  
 (the resin reagent referred to as Rink-acid resin)  
 This is referred to in the text as "Resin"

(e.g. Polymer = copolystyrene-1%divinylbenzene)



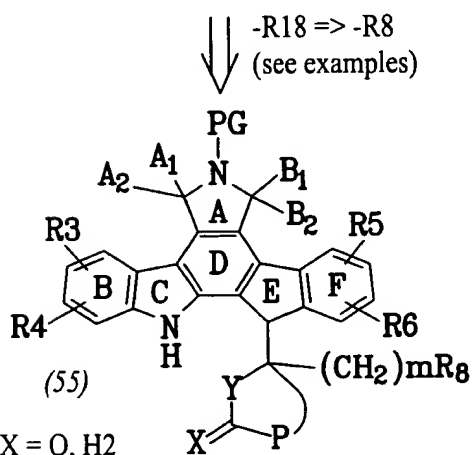
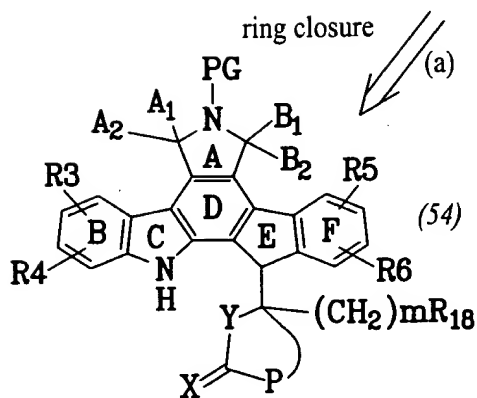
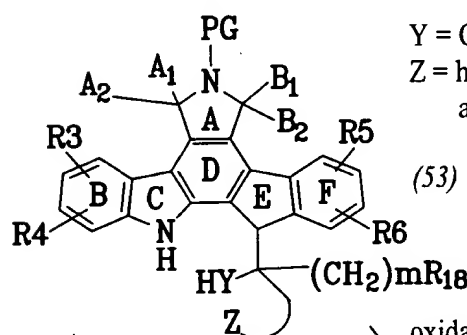
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FIG. 12

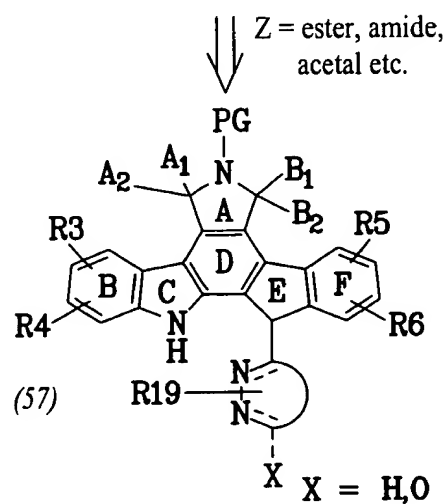
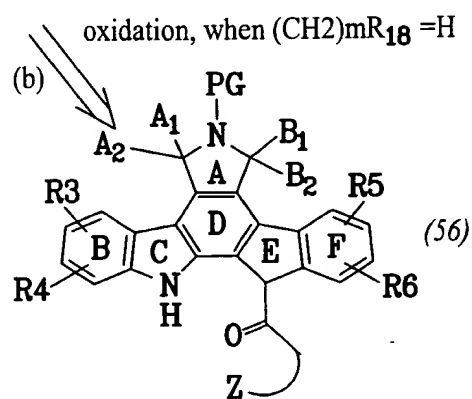


$Y = \text{O}, \text{NR}, \text{N-OR}, \text{S}$

$Z = \text{halide, ester, amide, carbamate, acetal, olefine or acetylene, etc.}$



$X = \text{O}, \text{H}_2$   
 $P = \text{C}, \text{NR}''$



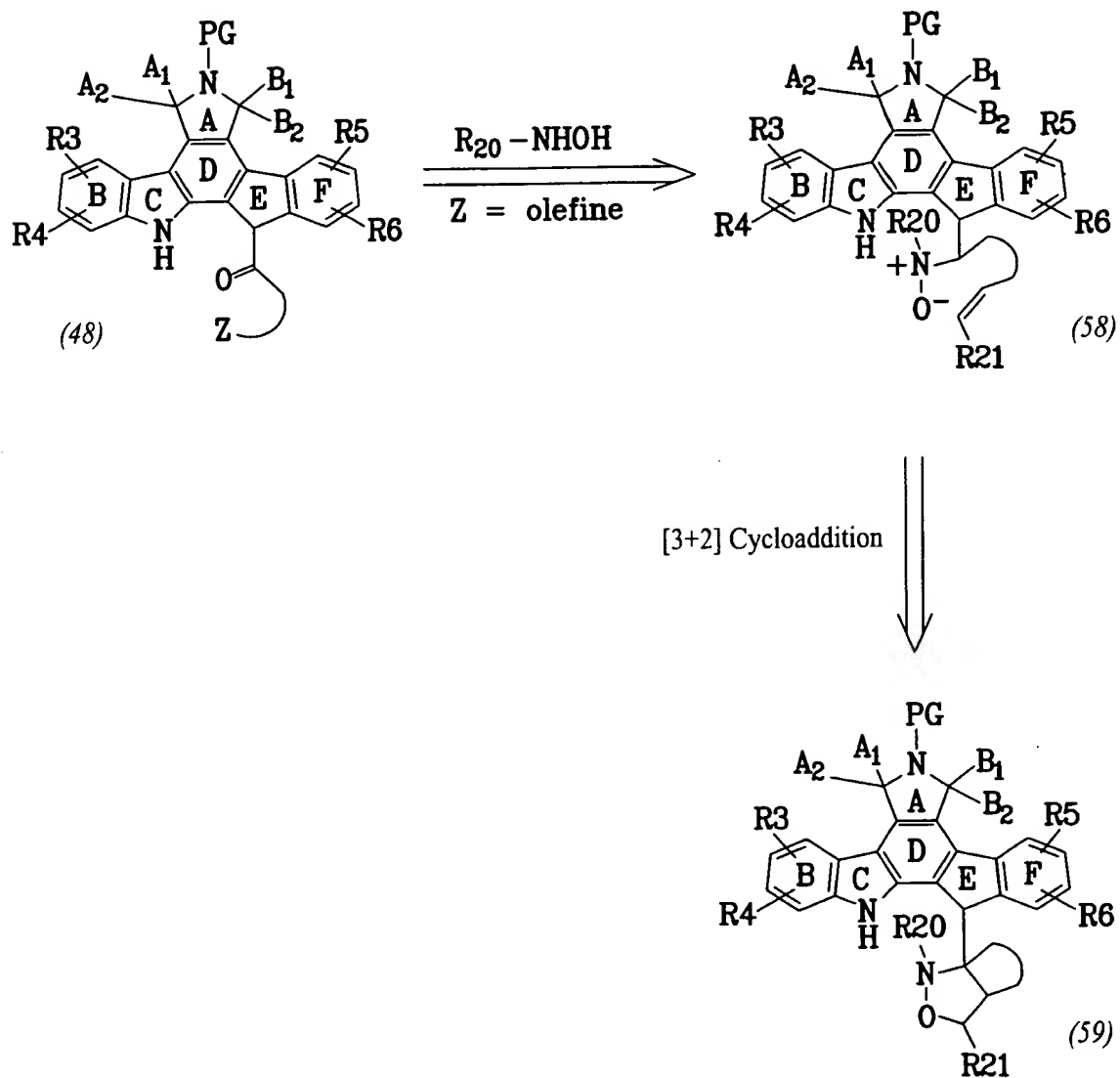
$X = \text{H}_2\text{O}$



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FIG. 13

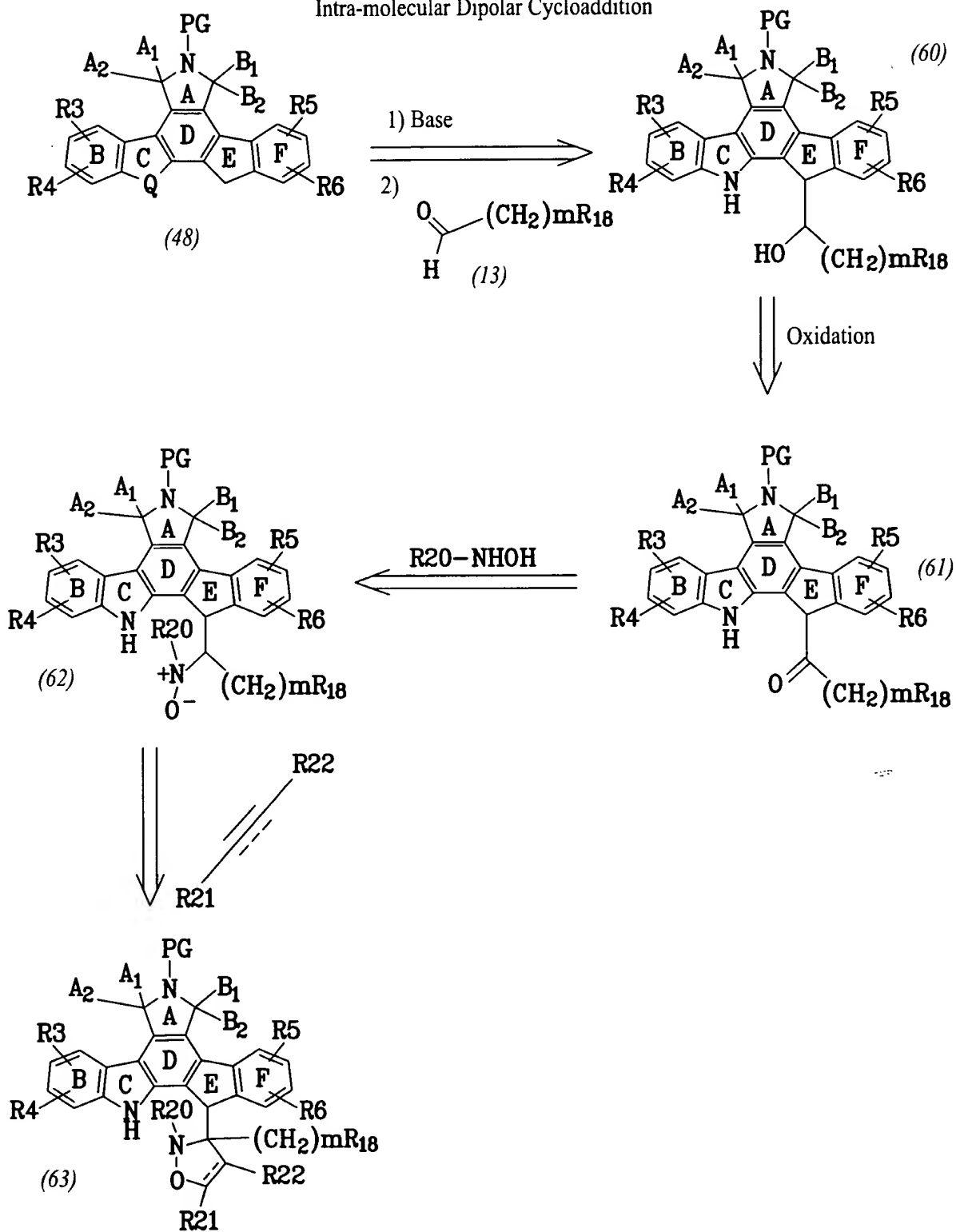
Preparation of Cyclic Substituents via Intra-molecular Dipolar Cycloaddition



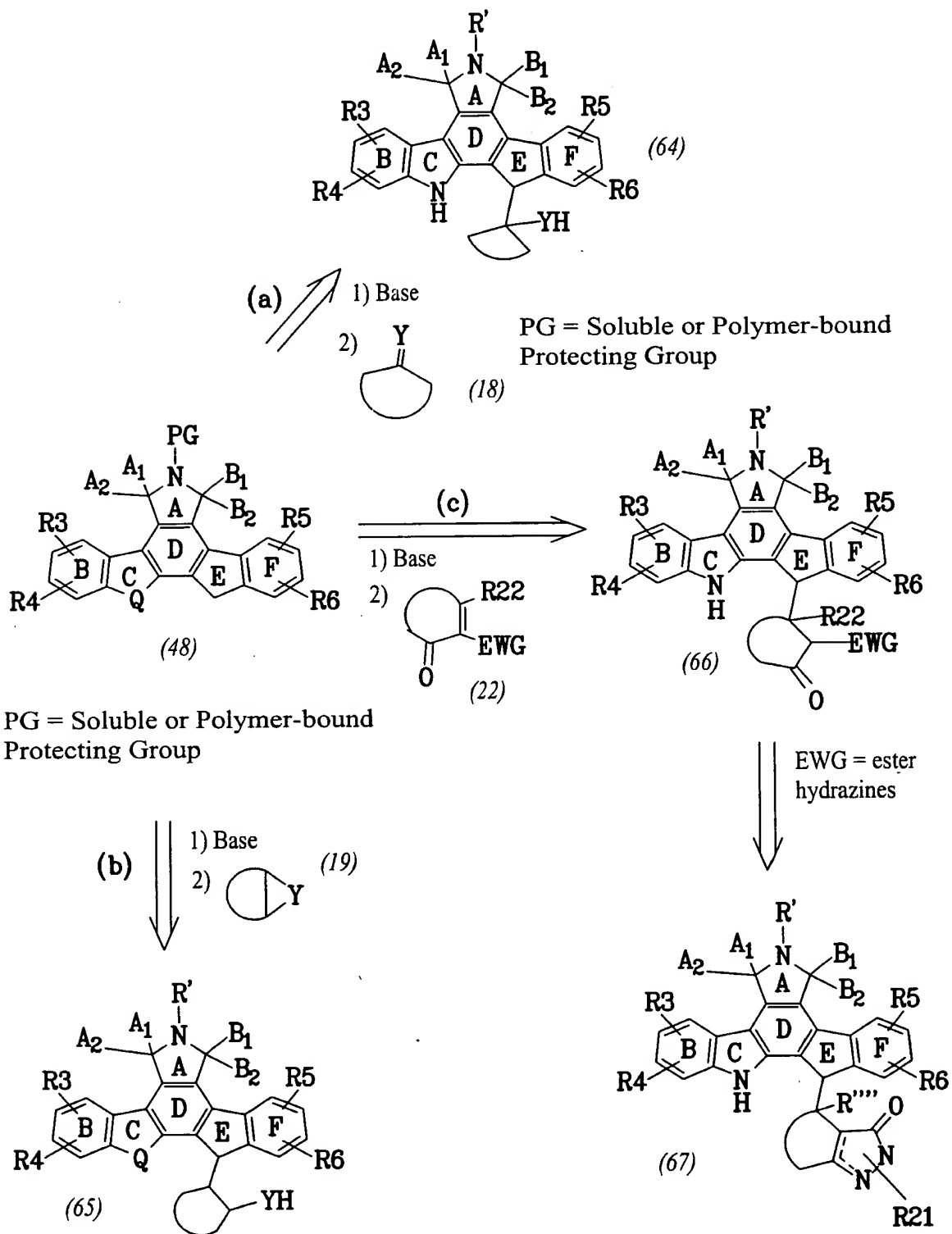


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*FIG. 14*

Preparation of Cyclic Substituents via  
Intra-molecular Dipolar Cycloaddition

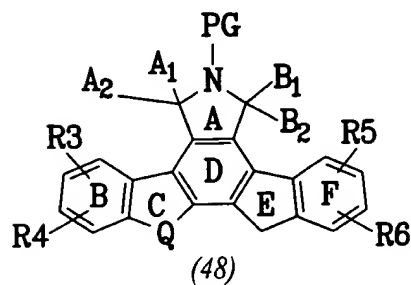


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*FIG. 15*



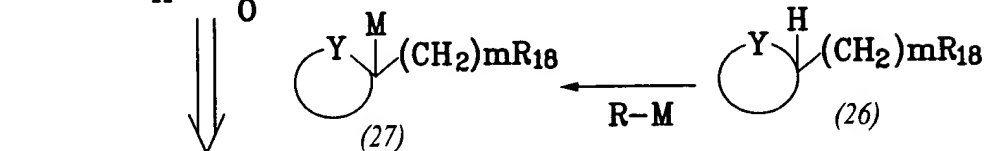
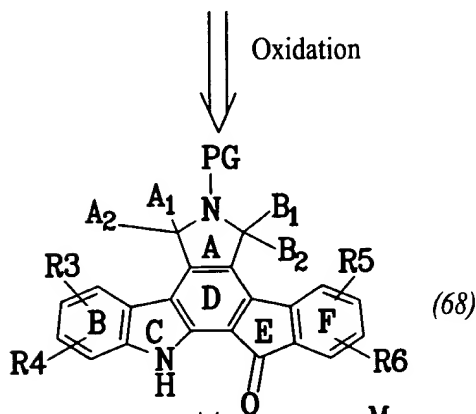


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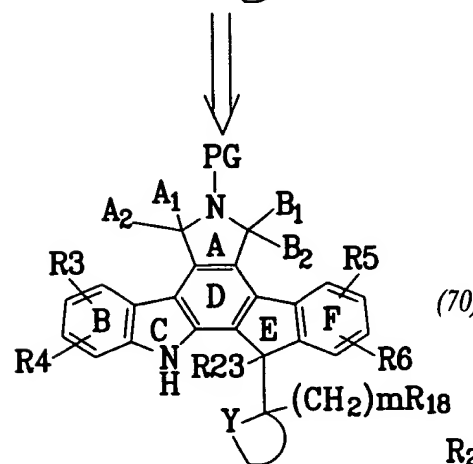
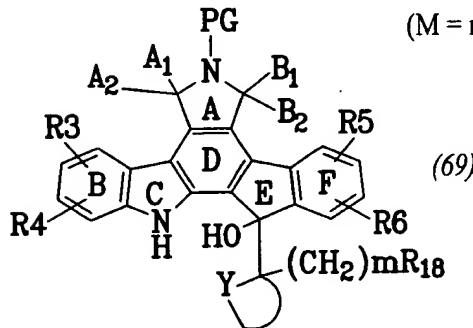


*FIG. 16*

PG = Soluble or  
 Polymer-bound  
 Protecting Group



(M = metal, e.g. Li, Mg etc.)

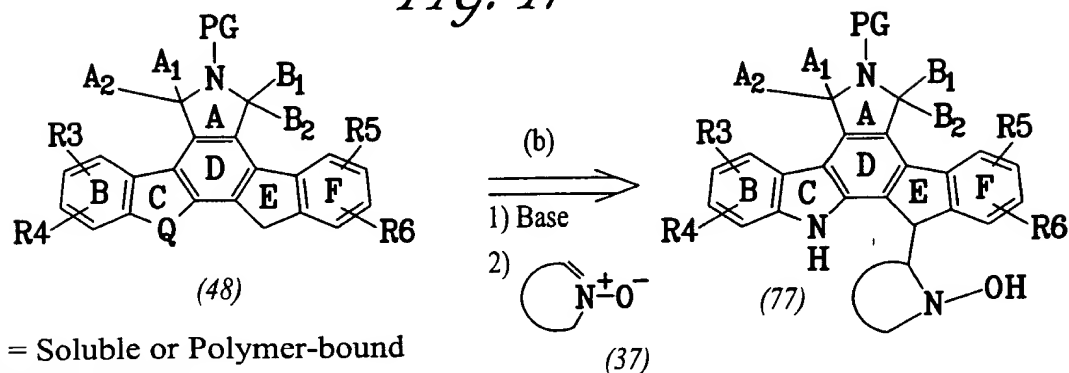


R<sub>23</sub> = F, SR<sub>24</sub>, H etc.

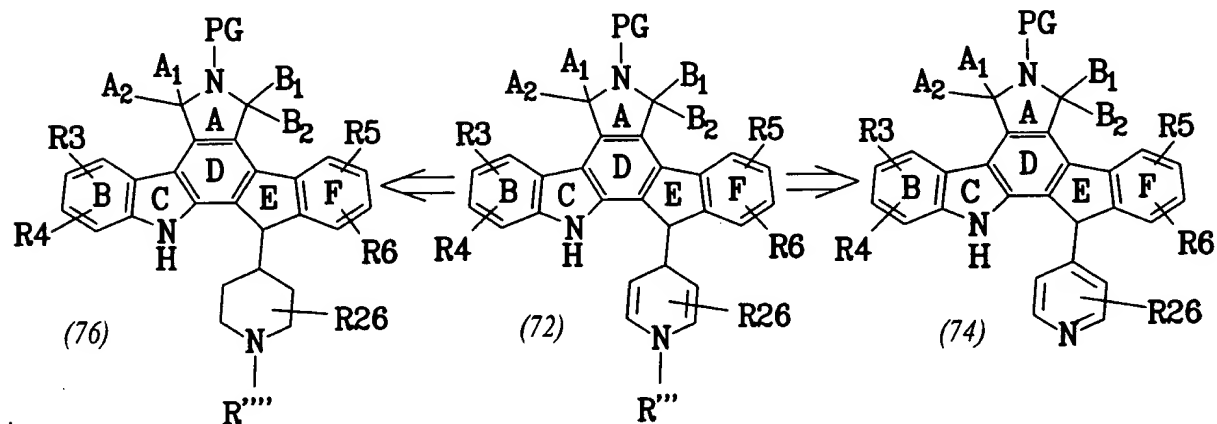
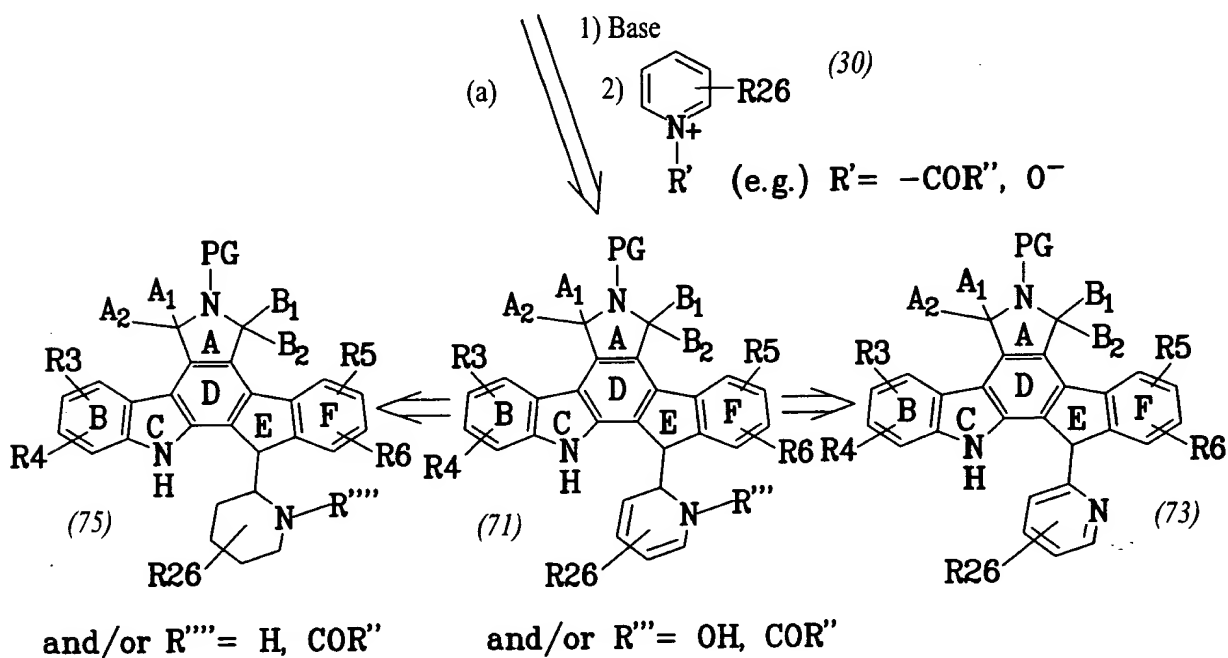


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FIG. 17



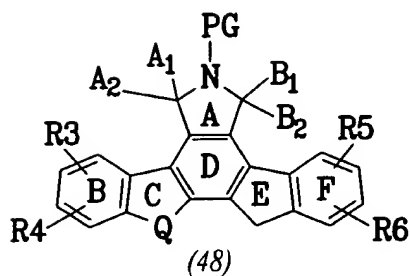
PG = Soluble or Polymer-bound Protecting Group



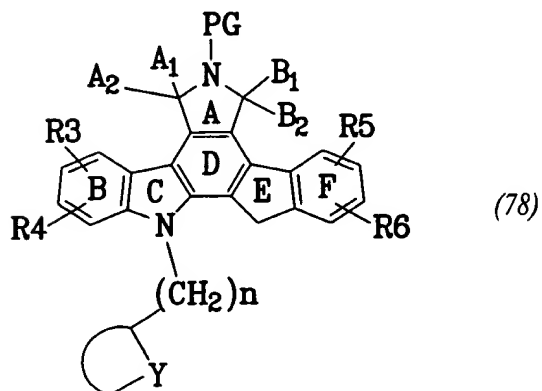
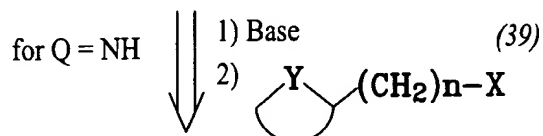


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FIG. 18

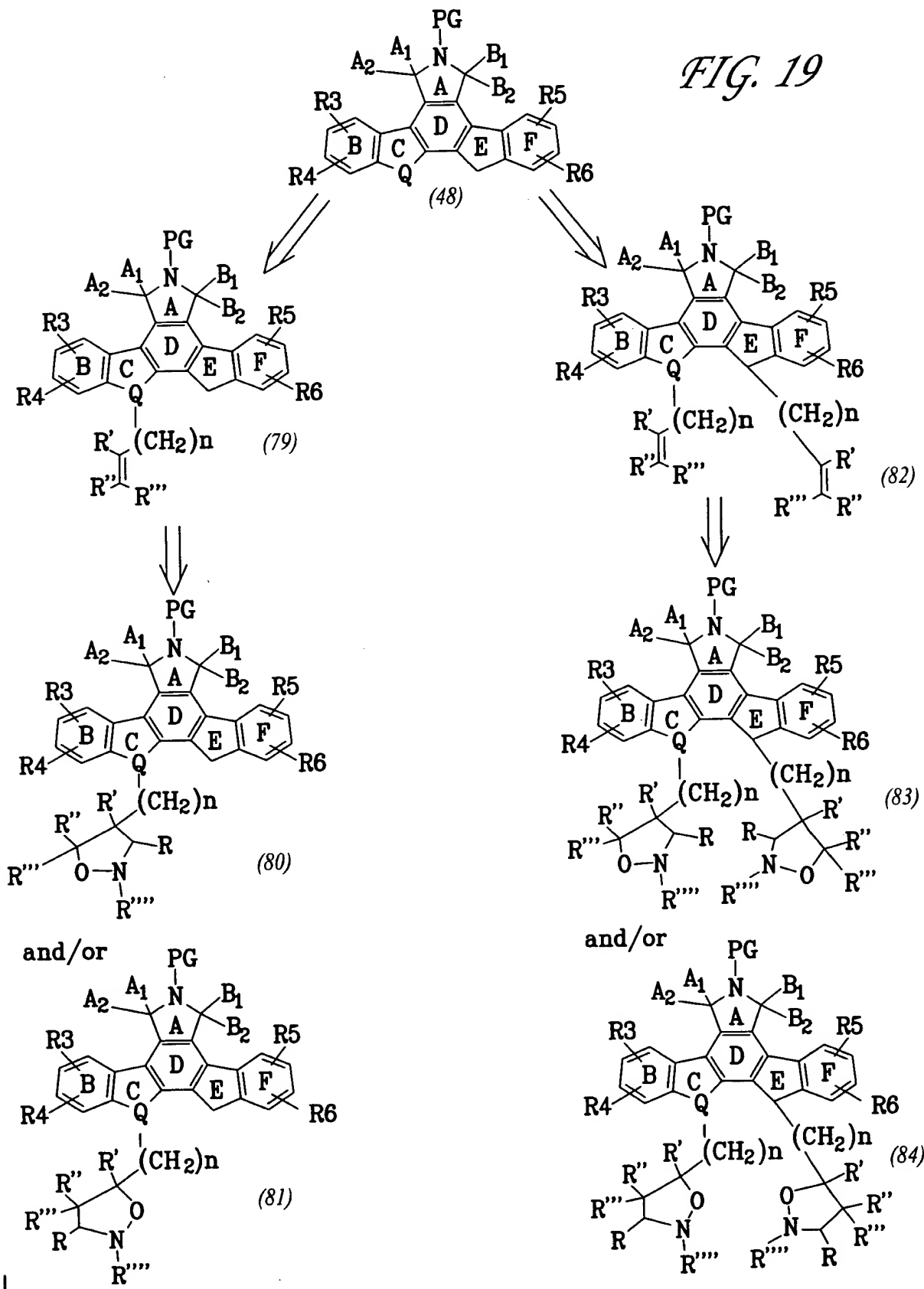


PG = Soluble or Polymer-bound  
Protecting Group



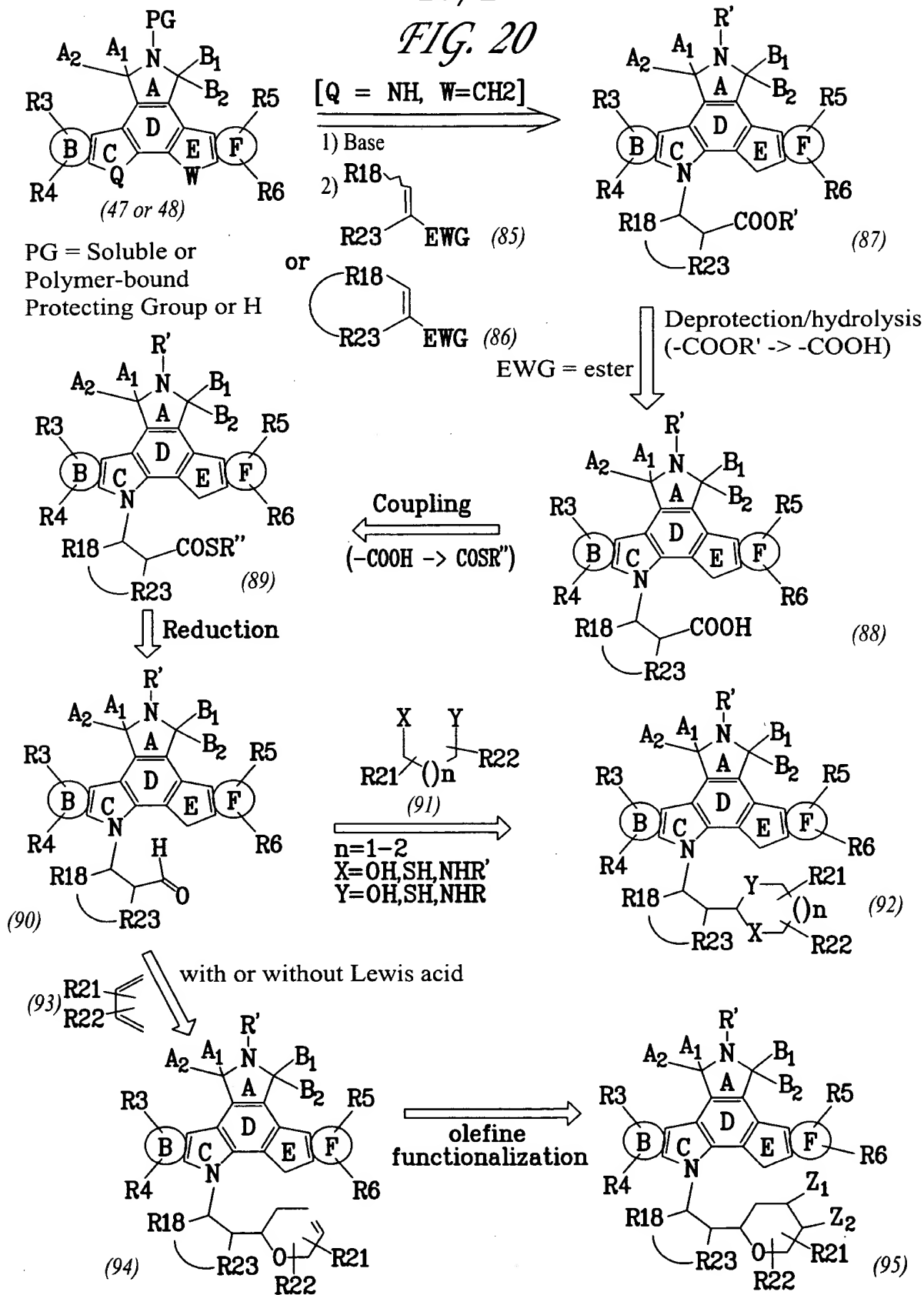
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FIG. 19



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FIG. 20



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FIG. 21

